Tom Bennett Art and Environmental Science Contest 2008

Getting Along in the Chaparral

The California Chaparral

Imagine gentle, rolling hills, covered with a thick blanket of green. It's March, and there's a misty fog slinking along distant hillsides. Leaves are wet with dew, each one brilliant in the subdued light.

An earthy scent fills the air. A deer mouse ventures out for a seed, then scampers for cover. A towhee calls, chipping slowly then picking up speed to a tremolo. Another bird answers back from across the next hill. Dry twigs rustle in the morning breeze. This is the California chaparral.

The Elfin Forest

California's climate and geography are ideal for this low, bushy ecosystem. Chaparral is dominated by shrubs that grow 6-20 feet (2 to 6 meters) tall. Small, thick leaves grow like mad during the rainy season, then wait out the hot, dry summers. A solid layer of shrubs flows endlessly over hills and down canyons, interrupted only by rocky outcrops and occasional roads.

The chaparral ecosystem occurs from southern Oregon to Baja California. It grows along coastal bluffs and hills, and throughout the valleys. It blankets entire ranges of foothills in some places. Further inland, it rings California's Central Valley, populating the foothills of the Sierra Nevada to the east. In the inland southern area, chaparral is visible on the hillsides above towns and tracts of new homes. Chaparral is most abundant in California, where it covers over 7 million acres, or 5% of the state.

Because chaparral looks like a forest of low shrubs, naturalists in the early 1900s called it the Elfin Forest. Unlike a forest, however, it has no under-story and no towering trees. The shrubs of the chaparral grow so thickly, only those low to the ground or able to fly can get through it. For humans, it is difficult or impossible to walk among them without a trail. Some shrubs are brittle or prickly. And any animal or person passing through is likely to end up with at least one tick hitchhiking to a good meal.

Many of the various shrubs that grow in the chaparral have some things in common – small, thick, waxy evergreen leaves, and multiple stems growing from one root system. They have similar strategies for preventing water loss. Small leaves help the plants survive in the hot, arid California summers. Some shrubs drop their leaves in summer. Others turn their leaves throughout the day, keeping their edges to the sun as it tracks overhead.

A Climate Just Right

Throughout its range, the chaparral is adapted to hot, dry summers and cool, wet winters. An average rainfall of about 15 inches (38 centimeters) falls between November and March. Chaparral plants do most of their growing in this short wet period, when rain and sunlight make growing conditions ideal. Being evergreen means they can take advantage of occasional summer storms and precipitation. This helps them produce enough energy to help get them through the harsh summer.

Coastal California has what geographers call a Mediterranean climate. This means that air moves onshore from the Pacific Ocean in the winter and spring months. This cool air is called a marine layer. Once the marine layer reaches the low inland hills, it begins to rise.

As air rises it cools and condenses to form clouds. Water droplets gather and eventually fall as rain. In summer and early fall, the cool ocean breezes have less effect on the inland region, leaving the landscape hot and dry. This is what gives California its desirable, mild climate. It is also part of why so many people live there.

In September, forces shift, and hot, dry winds rush westward through mountain canyons from the hot desert. These are the famous Santa Ana winds, which blow off and on from September through November. They fan the flames of annual wildfires, which are often devastating to the chaparral.

There are four other places on the earth with this same climate. The south-western edges of the continents of Africa, South America, and Australia, and the Mediterranean region of Europe all experience the cool, wet winters and hot, dry summers. Consequently, they all have plant species with similar adaptations.

Some of the plants in the European Mediterranean region look very much like plants in the California chaparral. They have the same small, waxy leaves and shrubby growth. The word “chaparral” comes from the Spanish *chapparo*, meaning “the place where scrub oaks grow.” This name was given to the California chaparral by the early Spanish explorers. It must have reminded them of their shrubby habitat back home.

California is home to more unique plants than any place on the continent. In fact, over one-quarter of all species of plants in the United States and Canada grow in California. Half of California’s plants are endemic, meaning they grow nowhere else in the world. Botanists call this the *California Floristic Province*. With its many unique plants, the chaparral helps make California one of the most biologically diverse regions of the world.

In Uniform

Chaparral is dominated by low shrubs with just a few trees. A *shrub* is a plant that grows with several stems from one central root system, and reaches a height of about 6-20 feet (2 to 7 meters). Stretches of landscape may be blanketed primarily in one species of shrub, while just over the hill another species may dominate.

Patches of chaparral with different dominant species are called *series*. Which series grows where depends on elevation, whether a slope faces toward or away from the sun, and soil type. Sometimes patches are mixed with two or three dominant shrubs. Chaparral is called *mature* when all the shrubs growing in an area have been growing 10 years or more since the last fire.

Among these dominant species is chamise, the most common shrub in the chaparral. It has needle-like leaves and tiny white flowers that seem to glow in the abundant sunlight. Other shrubs include mountain mahogany, several species of ceanothus (or California lilac), and scrub oaks. The beautiful manzanitas with their red-brown bark and bright red berries are common in the chaparral as well.

When summer comes on, chaparral plant can go dormant, and even drop their leaves if necessary. Leaves grow only on the top layer of the shrubs, saving energy by not growing the entire length of the branches. This gives the chaparral a leggy look near ground-level, with all the growth like a green umbrella on the canopy. In the very hottest months, the dormant plants of the chaparral can make entire hillsides look dead.

In the bare underbrush, woodrat nests are unmistakable. These chunky, curious rodents gather sticks, branches and even litter from the area to build their nests. They are especially attracted to shiny objects. Their twiggy homes can exceed three feet (one meter) in height and width. Inside are several rooms, used for sleeping and storing food; they even have a restroom. Their fondness for using paper, shiny objects, water bottles, and various other human-made items in nest-building has earned them the nickname “packrat.”

Fire and Succession

The chaparral ecosystem is adapted to a cycle of fire. Lightning strikes from summer storms cause dozens of fires in the chaparral every year. For the most part, these fires are restricted to small areas and burn themselves out quickly. Fire burns rapidly through an area at a fairly low temperature, minimizing damage to plants and animal homes.

Shrubs burn above ground, often leaving ghost-like branches standing on the blackened landscape. Some shrubs re-sprout from a root crown that sits just below the soil surface, undamaged by the fire. Others rely on a multitude of seeds that have been stored in the soil over many years. In the spring after a fire, seeds sprout and new plants repopulate the area.

In a process called succession, annuals sprout up first. Annuals are plants that live only one year, producing seeds that ensure the next generation. After a few years, annuals give way to longer-lasting perennial shrubs, which dominate the landscape again. Chaparral grows burns and re-grows naturally in this way in 30-80 year cycles.

In the 21st Century, however, things are changing in the chaparral. Some 27 million Californians live in the vicinity of the chaparral, and that number increases every year. People are constantly building new neighborhoods, businesses, recreational and shopping areas to meet their own needs.

It is inevitable that this expansion takes over hillsides above already populated lowlands, once covered with chaparral. But fire remains the challenge. People put out fires to save their homes and communities. When people suppress or put out fires for many years, fuel builds up in the shrubby chaparral. When a fire does start, it burns hot and fast, taking a devastating toll on plant life and human property. Ironically, the build up of fuel increases the losses caused by the fires. Plants that can survive a natural fire often do not survive these intense conflagrations. With planning and care, however, human activity can be balanced with the needs of the chaparral ecosystem.

Recreation and Renewal

The division between human populated areas and chaparral is called the urban-wildlands interface. Because it is close to Los Angeles and other popular California cities, many people all over the country are familiar with the low, green expanses of the Elfin Forest. It is seen as background in hundreds of television programs, movies and videos.

So many people live very close to the chaparral, but know very little about it. It's often overlooked as people travel through it to forest, mountain and even beach destinations. And yet the chaparral provides us with an opportunity to learn about nature right outside our doors. Many recreation opportunities await us in the chaparral. The more we know, the better able we will be to protect our homes *and* habitats for wildlife in the diverse chaparral.